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text characters to form a line which may consists of 1 to N characters" by "a line of text", and it could be some part of intermediary text characters during the input, or a complete word, or an abbreviation, or a shorthand.

Concerning the 3rd question, the invention method utilizes a standard dictionary and is also able to accept the abbreviation input which contain the first character and some other characters of the word to input and the operator does not have to remember the abbreviation.

In the letter of Sept. 26, 1996 from Examiner it is stated that he found number of parts in the specification were not clear enough to understand and this list does not represent all the problems in the specification which should be reviewed more closely.

1. Detailed specification

- a) The purpose of S020 and T001 are not clear  
For example, What is ID check?
- b) Determining and Selection steps are very difficult to follow

2. Claims

- a) Use of a word 'data' makes the claim very difficult to read. For example, word data? or input data? line of text data?
- b) As in detailed description, determining and selecting steps are very difficult to follow. For example, what is predetermined range of line of text? This was not explained in the specification.

3) From the interview

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Concerning claim 13:

- a) Difference between word data and line of text
- b) What does the dictionary contain
- c) What is the role of abbreviation and shorthand in the invention
- d) Last paragraph in the claim is not clear enough to understand

In response to the above, I clarify the points, item by item, as mentioned below.

RE: 1. a) The purpose of S020 and T001 are not clear, e.g. What is ID check?

The ID check is the subprogram to test if there is the unique word which terminates with the last input character or which includes the same one as the last input character in the remaining part of line of text (word) other than that was already collated. Its test is made after the current input of character and prior to the dictionary lookup, for example, by the binary search technique which retrieves the data in the dictionary dividing the area into 2, in turn, or ISAM which is known as the Indexed Sequential Access Method etc. by the procedure commencing from S001. For example, it is assumed that there are three words "communication", "compete", "computer" after the input of "com" as the result of its prior search by S001 and its followings. Then, at the time of next input of "r", ID check step is activated to test

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if there is the unique word with the last character same as the last input character "r", or if there is the character same as the last input character in the remaining part of word other than that was already collated. There is no particular relation between S020 and T001. T001 is the entry of steps to find the unique data in the dictionary for the input of the first character followed by some other characters of word desired, partly utilizing the steps of S001 and followings, in this example process.

RE: 1. b) Determining and Selection steps  
are very difficult to follow

As an example, there are 12 records in the dictionary, e.g. 1 (its value=a), 2 (c), 3 (e), 4 (g), 5 (i), 6 (k), 7 (m), 8 (p), 9 (r), 10 (t), 11 (v), 12 (x) in ascending order of its contents. The input of "r" at this point makes the first search retrieve the data in the middle of the area. As it is not successful in this case, its area to retrieve is divided into two and upper half data of 7-8-9-10-11-12 are kept, as the retrieval area. And next search is made to find "r" in the middle of 7-8-9-10-11-12 and may find 9 containing "r" which is in the middle of the area as well as 10. If the data 10 is taken as the data in the middle of this area, the retrieval area is divided into 2 once again, and the its lower half data of 7-8-9 remains in the area to retrieve, and its

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third search may find the data of 9 with "r." It is a manner to perform the dictionary search using the above mentioned binary search or Indexed Sequential Access Method and could be also made by a random access manner in which the value of "r" in the example is used to generate the logical address for storing and locating data in the dictionary storage by which the data is retrieved at the time of each character input.

After the determination of the data by the above steps, the selection steps take place. The selection is relatively simple, because it is a way to select a desired word which has the last character same as the last input character or which has the same character as the last character in the remaining part of line of text (word) other than that was already collated between the input and the dictionary data.

For example, the input of "t" is able to select "shipment", after having 3 words of shippable·shipping·shipment, by the input up to "ship."

RE: 2. Claims

- a) Use of a word "data" makes the claim very difficult to read. For example, word data? or input data? line of data?

I have amended claims to state without using "data", as was indicated by Examiner, to avoid confusion.

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## RE: 2. Claims

- b) As in the detailed description, determining and selecting steps are very difficult to follow. For example, what is predetermined range of line of text? This was not explained in the specification.

I have amended the claims.  
I mean the specific range of number for the line of text to determine by means for determining a unique line of text by "the predetermined number range of line of text." It is primarily intended to find the unique line of text in the dictionary, but sometimes we need the several data containing the same keyword in the dictionary. Therefore, it means the range of 2, 1-3, 1-5, and so on, besides the necessity to seek the unique one.

## RE: 3. From the interview

- a) Differences between word data and line of text  
b) What does the dictionary contain

I mean "a string of text characters to form a line which may consists of 1 to N characters" by "a line of text", and it could be some part of text characters during the input, or a complete word, or an abbreviation, or a shorthand.

The invention method utilizes a standard dictionary and is also able to accept the abbreviation input which contain a first character and some other characters of

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data input and the operator does not have to remember the abbreviation.

RE: 3. From the interview

- a) What is the role of abbreviation and shorthand in the invention

The invention system utilizes a standard dictionary and does not require a specific dictionary for the abbreviation with its original form of word to retrieve, though the input of abbreviated form is acceptable in a manner to find the unique line of text in the dictionary containing the first character followed by some other characters of input text. A shorthand has no particular role in the present invention.

RE: 3. From the interview

- d) Last paragraph in the claim is not clear enough to understand

The last paragraph states about the output of the unique line of text which was determined by means of determining a unique line of text, or output of the line of text which was selected by means for selecting a desired line of text on the display, after the successful determination by means for determining the unique line of text, in case of having plural relevant words in the dictionary.

In summary, the detailed description of the drawings are mentioned below to explain the

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procedures to determine and select the line of text in the dictionary. Prior to it, please let me explain in brief about the differences between the conventional system and the present invention, i.e. an abbreviation input of the conventional system requires training and memory of the operator and its standard input displays all words which match the input, i.g. if the input is COM, then all words beginning with COM (COMMA, COMPUTER, etc) are displayed and the operator selects one of them.

In the invention system, the word is only displayed when it has been uniquely identified and the system makes an audible noise to alert operator, despite the kinds of input of:

- 1) some leading characters (strokes) to be unique, (character by character or stroke by stroke)  
\*\*\* ( ) is applied to all mentioned below
- 2) first character and some other characters to be unique
- 3) first and end part to be unique
- 4) first and last character, and some other characters between first and last one to be unique
- 5) Stem of word and the last character to be unique
- 6) Stem of word and the some other character to be unique

## DETAILED DESCRIPTION OF THE DRAWINGS

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In the flowchart, A001 is the first step to clear the contents of the program counter, flag, and the working area, at the beginning of the process.

A002 accepts a string of characters, character by character, or stroke by stroke, from the keyboard or the handwriting instruments.

A003 checks if the input is the end of data to show the end of transaction, and the step goes to termination of process if it is the end. Otherwise, the step proceeds to the next A003A.

A003A tests if the NONE FLAG is ON which means that there is no word including the word input, in the dictionary. If NONE FLAG is ON, the step goes to S020 in Fig. 9 in which the ID check steps are performed to find the unique one with the last character same as the last input character or with the character same as the last input character in the remaining positions other than that was already collated (Fig. 9), as the ID check steps are performed after the input of last input character and prior to its dictionary search, utilizing a flag of NONE FLAG which is set ON at A006B in Fig. 3. It means that the attempt to search at A006 in Fig. 3 by the previous input has failed and the NONE FLAG is set ON for the purpose to activate ID check steps to find the data for "some leading characters input and some other character to be unique in the dictionary."



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If NONE FLAG is OFF, the step proceeds to A003B.

A003B tests if the input is a separator code. If it is the separator, A003C clears the contents of input buffer and the step goes back to A002 for the next input. Otherwise the step goes to A004.

At A004, the input character is displayed at the end of characters string on the display.

A005 adds the input to the end of previous data in the input buffer memory.

A006 performs a dictionary search to get the data which has the same leading part as the input and unique in the dictionary as one of example in the case, as there are some other cases to find the data which is unique, despite the kinds of input, e.g. the input of the first character followed by some other characters for the line of text to represent the unique word in the dictionary and so on.

A006A tests the result of dictionary search at the above A006 which means "more data to retrieve or not" in this example. If it is negative, A006B turns the NONE FLAG ON and goes back to A002.

In this example, NONE FLAG is used for the purpose to do a sequence of "input of following character and ID check to find the unique word with the last character same as the last input character or with the character same as the last input character in the remainin part other than that was already collated."

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If the test result of A006A is not negative which means that there are still more words to retrieve, next A007 tests if the step of A006 found the unique one in the dictionary. If not, the step goes back to A002 for the next input to continue the input and dictionary search.

If the unique one was found at A006, A008 replaces the input on the display with the unique one from dictionary and the contents of input buffer are cleared for the next input.

Next A008A is the selection step for the case having plural relevant words in the dictionary after finding the unique word in the dictionary, in a manner that one of relevant words is selected on the display in this case, because the other selection steps are performed by ID check at S020 in Fig. 9 testing the existence of word which is unique and terminates with the same one as the last input character or which is unique and includes the same character as the last input character in the remaining part of relevant words other than that was already collated. Then the step goes back to A002 for the next input.

S001 is an entry of the subprogram to search the unique line of text or stroke data in the dictionary.

S002 tests if there is no more data. The step goes to the exit in case of having no data to retrieve in the dictionary.

Next S003 gets the data located in the middle of the area between the upper limit

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and lower limit of the dictionary.

S004 checks if the leading part of data from dictionary is greater than that of input. If the greater flag is ON, S005 divides the retrieval area size into 2 to use the lower half area for the following retrieval, as there is a possibility to find the unique one in the lower half area, because the dictionary data found at S003 was greater than the data input. Then the step goes back to S002. If the greater than flag is OFF at S004, the step proceeds to S006.

At S006, it is tested if the leading part of data from the dictionary is equal to that of data input. If it is equal, S007 tests if it is single and S008 turns the flag for the unique data ON, in case of single data found and goes to S012. Otherwise, the step goes to S012.

If it is not equal at the test of S006, the step goes to S009 in which the test is made if the leading part of data from the dictionary is less than that of data input.

If the less than flag is ON at S009, the retrieval area size is divided into 2 to use the upper half area for the following retrieval, as there is a possibility to find the unique data in the upper half area because the dictionary data found at S003 was less than that of data input.

If the less than flag is OFF at S009, there is something wrong with the steps and goes to the error procedure of S011 which is not described here, as it is not closely related to the invention.

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Branching here from S007, S012 tests if plural data found at S007 have the same stem of word. If YES, S012A turns the NONE FLAG ON and goes back to A002 for the next input. This flag is to intentionally activate the ID check steps after the next input and prior to its dictionary search, in this example. If NO, the step goes to S012B.

S012B tries to find the data with the leading part which is greater than data input in the upper half of the retrieval area in the dictionary.

S013 tests if the data was found at S012B and branch takes place upon its result, to S014 if NOT FOUND, and to S015 if FOUND.

S014 sets new upper limit to retrieve in the dictionary using the position of the upper limit by which S012B was attempted because the upper half area in this case is occupied by the data with the leading part equal to data input. Then the step goes to S016.

S015 sets new upper limit to retrieve in the dictionary using the position of data found at the step of S012B. Then the step goes to S016.

S016 tries to find data with the leading part less than that of data input in the lower half area of the dictionary.

S017 tests if the data was found.

If the data was not found, S018 sets new lower limit using the position of the lower limit by which S016 was attempted, because the lower area is occupied by the data with the leading part equal to that of data

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input. Then the step goes to the exit of this subprogram.

If the data was found at S017, S019 sets new lower limit to retrieve using the position of data with leading part less than that of data input and branches to the exit of this subprogram.

Branching from A003A when NONE FLAG is on, S020 performs ID check steps to start with S023 which is the entry of subprogram. It tests if there is the unique data which has the last character same as the last input character, or which includes the same one as the last input character in the remaining positions other than that was already collated with data input.

Next S021 checks the FLAG for unique word, after coming back from ID check.

If its flag is OFF, the step goes back to A002 for the next input. If the flag is ON, the step proceeds to next S022 which turns the NONE FLAG OFF and supplements the remaining part of data input on the display. Then the step goes back to A002 for the next input.

S023 is the start of subprogram which performs determination process of the unique data. S023 examines data which were selected by the prior lookup in the dictionary.

S024 tests if there is unique data which terminates with the same one as the last input. If NO, the step goes to S026. If YES, the step proceeds to the next S025 which turns the FLAG for unique word ON and goes to exit of this subprogram.

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At S026, it is tested if there is unique data which includes the last input in the remaining positions other than that was already collated with data input. If YES, the step goes to S025. If NO, the step proceeds to the next S027 in which the system extracts data which do not have the same one as the last input or which do not include the same one as the last input in the remaining positions other than that was already collated with data input.

As a subset of the dictionary search for data input consisting of a first character and some other characters, T001 which is equivalent to the above mentioned S001 in its role in this example, is the entry of this subprogram. It performs the dictionary search for the data input with the first character and some other characters of data input.

T002 which is equivalent to the above mentioned S002 in its role in this example, checks if there is still more word to retrieve in the dictionary. If there is no more word, the step goes to the exit. If there are words to retrieve, the step goes to T002A.

At T002A, the branch takes place depending on the first input or not. In case of the first one of data to input, the step goes to above mentioned S003. If it is not the first one, the step goes to next T002B.

T002B is to check if all words between upper and lower limit in the dictionary have the same leading part as data input.

T002C selects the words with the leading part which is not the same as that of the

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data input.

T002D shifts one character to the left for every words selected at T002C and extracts words which have no more characters after making the character shift, as those words are no longer used for the following search process.

T002E sets new upper and lower limit to retrieve in the dictionary, after extracting words at T002D. Then the step goes to the above mentioned S003. (End of DETAILED DESCRIPTION OF THE DRAWINGS).

As a result of the above mentioned amendment of claims, the check in the amount of \$103 was sent separately by Int'l Express PO Mail, together with the original of this documents.

Please address all your future correspondence to the applicant undersigned for this patent application.

Sincerely,



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